

AAGCTCAGAT	CTACCTGCCT	GAGGGCGTCC	GGTTCCAGCT	GGCCCTTCCC	GAGGGGGAGA	60
GGGAGGCCTT	TCTAAAGCC	CTTCAGGACG	CTACCCGGGG	GCGGGTGGTG	GAAGGGTAAAC	120
ATG AGG GGG	ATG CTG CCC	CTC TTT GAG CCC	AAG GGC CGG	GTC CTC CTG		168
Met Arg Gly	Met Leu Pro	Leu Phe Glu	Pro Lys Gly	Arg Val Leu		
1	5	10	15	15		
GTG GAC GGC	CAC CAC CTG	GCC TAC CGC	ACC TTC CAC	GCC CTG AAG GGC		216
Val Asp Gly	His His Leu	Ala Tyr Arg	Thr Phe His	Ala Leu Lys Gly		
20	25	30	30	30		
CTC ACC ACC	AGC CGG GGG	GAG CCG GTG	CAG GCG GTC	TAC GGC TTC GGC		264
Leu Thr Thr	Ser Arg Gly	Glu Pro Val	Gln Ala Val	Tyr Gly Phe Ala		
35	40	45	45	45		
AAG AGC CTC	CTC AAG GCC	CTC AAG GAG GAC	GGG GAC GCG	GCG GTG ATC GTG		312
Lys Ser Leu	Leu Lys Ala	Leu Lys Glu	Asp Gly Asp	Ala Val Ile Val		
50	55	60	60	60		
GTC TTT GAC	GCC AAG GCC	CCC TCC TTC CGC	CAC GAG GCG	TAC GGG GGG		360
Val Phe Asp	Ala Lys Ala	Pro Ser Phe	Arg His Glu	Ala Tyr Gly Gly		
65	70	75	80	80		
TAC AAG GCG	GGC CGG GCC	CCC ACG CCG	GAG GAC TTT	CCC CGG CAA CTC		408
Tyr Lys Ala	Gly Arg Ala	Pro Thr Pro	Glu Asp Phe	Pro Arg Gln Leu		
85	90	95	95	95		
GCC CTC ATC	AAG GAG CTG	GTG GAC CTC	CTG GGG CTG	GCG CGC CTC GAG		456
Ala Leu Ile	Lys Glu Leu Val	Asp Leu	Gly Leu Ala	Arg Leu Glu		
100	105	110	110	110		
GTC CCG GGC	TAC GAG GCG	GAC GTC CTG	GCC AGC CTG	GCC AAG AAG		504
Val Pro Gly	Tyr Glu Ala Asp	Asp Val Leu	Ala Ser Leu	Ala Lys Lys		
115	120	125	125	125		
GCG GAA AAG	GAG GGC TAC	GAG GTC CGC	ATC ATC CTC	ACC GCC GAC AAA GAC		552
Ala Glu Lys	Glu Gly Tyr	Glu Val Arg	Ile Leu Thr	Ala Asp Lys Asp		
130	135	140	140	140		
CTT TAC CAG	CTC CTT TCC	GAC CGC ATC	CAC GTC CTC	CAC CCC GAG GGG		600
Leu Tyr Gln	Leu Leu Ser	Asp Arg Ile	His Val	Leu His Pro Glu Gly		
145	150	155	155	160		
TAC CTC ATC	ACC CCG GCC	TGG CTT TGG	GAA AAG TAC	GGC CTG AGG CCC		648
Tyr Leu Ile	Thr Pro Ala	Trp Leu Trp	Glu Lys Tyr	Gly Leu Arg Pro		
165	170	175	175	175		
GAC CAG TGG	GCC GAC TAC	CGG GCC CTG	ACC GGG GAC	GAG TCC GAC AAC		696
Asp Gln Trp	Ala Asp Tyr	Ala Glu	Thr Gly Asp	Glu Ser Asp Asn		
180	185	190	190	190		
CTT CCC GGG	GTC AAG GGC	ATC GGG GAG	AAG ACG GCG	AGG AAG CTT CTG		744
Leu Pro Gly	Val Lys Gly	Ile Gly Glu	Lys Thr Ala	Arg Lys Leu		
195	200	205	205	205		

FIG. 1A

GAG	GAG	TGG	GGG	AGC	CTG	GAA	GCC	CTC	CTC	AAG	AAC	CTG	GAC	CGG	CTG	792
Glut	Glut	Trp	Gly	Ser	Leu	Glu	Ala	Leu	Leu	Lys	Asn	Leu	Asp	Arg	Leu	
210				215						220						
AAG	CCC	GCC	ATC	CGG	GAG	AAG	ATC	CTG	GCC	CAC	ATG	GAC	GAT	CTG	AAG	840
Lys	Pro	Ala	Ile	Arg	Glu	Lys	Ile	Leu	Ala	His	Met	Asp	Asp	Asp	Leu	Lys
225				230				250		235					240	
CTC	TCC	TGG	GAC	CTG	GCC	AAG	GTG	CGC	ACC	GAC	CTG	CCC	CTG	GAG	GTG	888
Leu	Ser	Trp	Asp	Leu	Ala	Lys	Val	Arg	Thr	Asp	Leu	Pro	Leu	Glu	Val	
				245				250						255		
GAC	TTC	GCC	AAA	AGG	CGG	GAG	CCC	GAC	CGG	GAG	AGG	CTT	AGG	GCC	TTT	936
Asp	Phe	Ala	Lys	Arg	Arg	Glu	Pro	Asp	Arg	Glu	Arg	Leu	Arg	Ala	Phe	
			260				265				270					
CTG	GAG	AGG	CTT	GAG	TTT	GGC	AGC	CTC	CTC	CAC	GAG	TTC	GGC	CTT	CTG	984
Leu	Glu	Arg	Leu	Glu	Phe	Gly	Ser	Leu	Leu	His	Glu	Phe	Glu	Leu	Leu	
			275			280					285					
GAA	AGC	CCC	AAG	GCC	CTG	GAG	GAG	GCC	CCC	TGG	CCC	CCG	GAA	GGG		1032
Glu	Ser	Pro	Lys	Ala	Leu	Glu	Glu	Ala	Pro	Trp	Pro	Pro	Pro	Glu	Gly	
			290			295				300						
GCC	TTC	GTG	GGC	TTT	GTG	CTT	TCC	CGC	AAG	GAG	CCC	ATG	TGG	GCC	GAT	1080
Ala	Phe	Val	Gly	Phe	Val	Leu	Ser	Arg	Lys	Glu	Pro	Met	Trp	Ala	Asp	
			305			310				315				320		
CTT	CTG	GCC	CTG	GCC	GCC	AGG	GGG	GGC	CGG	GTC	CAC	CGG	GCC	CCC		1128
Leu	Leu	Ala	Leu	Ala	Ala	Ala	Arg	Gly	Gly	Arg	Val	His	Arg	Ala	Pro	
			325			330			330				335			
GAG	CCT	TAT	AAA	GCC	CTC	AGG	GAC	CTG	AAG	GAG	GCG	CGG	GGG	CTT	CTC	1176
Glu	Pro	Tyr	Lys	Ala	Leu	Arg	Asp	Leu	Lys	Glu	Ala	Arg	Gly	Leu	Leu	
			340				345				350					
GCC	AAA	GAC	CTG	AGC	GTT	CTG	GCC	CTG	AGG	GAA	GGC	CTT	GGC	CTC	CCG	1224
Ala	Lys	Asp	Leu	Ser	Val	Leu	Ala	Leu	Arg	Glu	Gly	Leu	Gly	Leu	Pro	
			355			360				365						
CCC	GGC	GAC	GAC	CCC	ATG	CTC	CTC	GCC	TAC	CTC	CTG	GAC	CCT	TCC	AAC	1272
Pro	Gly	Asp	Asp	Pro	Met	Leu	Leu	Ala	Tyr	Leu	Leu	Asp	Pro	Ser	Asn	
			370			375				380						
ACC	ACC	CCC	GAG	GGG	GTG	GCC	CGG	CGC	TAC	GGC	GGG	GAG	TGG	ACG	GAG	1320
Thr	Thr	Pro	Glu	Gly	Val	Ala	Arg	Arg	Tyr	Gly	Gly	Glu	Trp	Thr	Glu	
			385			390				395				400		
GAG	GCG	GGG	GAG	CGG	GCC	CTT	TCC	GAG	AGG	CTC	TTC	GCC	AAC	CTG		1368
Glu	Ala	Gly	Glu	Arg	Ala	Ala	Leu	Ser	Glu	Arg	Leu	Phe	Ala	Asn	Leu	
			405				410			415						
TGG	GGG	AGG	CTT	GAG	GGG	GAG	GAG	AGG	CTC	CTT	TGG	CTT	TAC	CGG	GAG	1416
Trp	Gly	Arg	Leu	Glu	Gly	Glu	Glu	Arg	Leu	Leu	Trp	Leu	Tyr	Arg	Glu	
			420				425				430					

FIG. 1B

GTG GAG AGG CCC CTT TCC GCT GTC CTG GCC CAC ATG GAG GCC ACG GGG Val Glu Arg Pro Leu Ser Ala Val Leu Ala His Met Glu Ala Thr Gly 435 440 445	1464
GTG CGC CTG GAC GTG GCC TAT CTC AGG GCC TTG TCC CTG GAG GTG GCC Val Arg Leu Asp Val Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala 450 455 460	1512
GAG GAG ATC GCC CGC CTC GAG GCC GAG GTC TTC CGC CTG GCC GGC CAC Glu Glu Ile Ala Arg Leu Glu Ala Glu Val Phe Arg Leu Ala Gly His 465 470 475 480	1560
CCC TTC AAC CTC AAC TCC CGG GAC CAG CTG GAA AGG GTC CTC TTT GAC Pro Phe Asn Leu Asn Ser Arg Asp Gln Leu Glu Arg Val Leu Phe Asp 485 490 495	1608
GAG CTA GGG CTT CCC GCC ATC GGC AAG ACG GAG AAG ACC GGC AAG CGC Glu Leu Gly Leu Pro Ala Ile Gly Lys Thr Glu Lys Thr Gly Lys Arg 500 505 510	1656
TCC ACC AGC GCC GCC GTC CTG GAG GCC CTC CGC GAG GCC CAC CCC ATC Ser Thr Ser Ala Ala Val Leu Glu Ala Leu Arg Glu Ala His Pro Ile 515 520 525	1704
GTG GAG AAG ATC CTG CAG TAC CGG GAG CTC ACC AAG CTG AAG AGC ACC Val Glu Lys Ile Leu Gln Tyr Arg Glu Leu Thr Lys Leu Lys Ser Thr 530 535 540	1752
TAC ATT GAC CCC TTG CCG GAC CTC ATC CAC CCC AGG ACG GGC CGC CTC Tyr Ile Asp Pro Leu Pro Asp Leu Ile His Pro Arg Thr Gly Arg Leu 545 550 555 560	1800
CAC ACC CGC TTC AAC CAG ACG GCC ACG GCC ACG GGC AGG CTA AGT AGC His Thr Arg Phe Asn Gln Thr Ala Thr Ala Thr Gly Arg Leu Ser Ser 565 570 575	1848
TCC GAT CCC AAC CTC CAG AAC ATC CCC GTC CGC ACC CCG CTT GGG CAG Ser Asp Pro Asn Leu Gln Asn Ile Pro Val Arg Thr Pro Leu Gly Gln 580 585 590	1896
AGG ATC CGC CGG GCC TTC ATC GCC GAG GAG GGG TTG CTA TTG GTG GCC Arg Ile Arg Arg Ala Phe Ile Ala Glu Glu Gly Trp Leu Leu Val Ala 595 600 605	1944
CTG GAC TAT AGC CAG ATA GAG CTC AGG GTG CTG GCC CAC CTC TCC GGC Leu Asp Tyr Ser Gln Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly 610 615 620	1992
GAC GAG AAC CTG ATC CGG GTC TTC CAG GAG GGG CGG GAC ATC CAC ACG Asp Glu Asn Leu Ile Arg Val Phe Gln Glu Gly Arg Asp Ile His Thr 625 630 635 640	2040
GAG ACC GCC AGC TGG ATG TTC GGC GTC CCC CGG GAG GCC GTG GAC CCC Glu Thr Ala Ser Trp Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro 645 650 655	2088

FIG. 1C

CTG ATG CGC CCG GCG GCC AAG ACC ATC AAC TTC GGG GTC CTC TAC GGC Leu Met Arg Arg Ala Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly 660 665 670	2136
ATG TCG GCC CAC CGC CTC TCC CAG GAG CTA GCC ATC CCT TAC GAG GAG Met Ser Ala His Arg Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu 675 680 685	2184
GCC CAG GCC TTC ATT GAG CGC TAC TTT CAG AGC TTC CCC AAG GTG CGG Ala Gln Ala Phe Ile Glu Arg Tyr Phe Gln Ser Phe Pro Lys Val Arg 690 695 700	2232
GCC TGG ATT GAG AAG ACC CTG GAG GAG GGC AGG AGG CGG GGG TAC GTG Ala Trp Ile Glu Lys Thr Leu Glu Glu Gly Arg Arg Arg Gly Tyr Val 705 710 715 720	2280
GAG ACC CTC TTC GGC CGC CGC CGC TAC GTG CCA GAC CTA GAG GCC CGG Glu Thr Leu Phe Gly Arg Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg 725 730 735	2328
GTG AAG AGC GTG CGG GAG GCG GCC GAG CGC ATG GCC TTC AAC ATG CCC Val Lys Ser Val Arg Glu Ala Ala Glu Arg Met Ala Phe Asn Met Pro 740 745 750	2376
GTC CAG GGC ACC GCC GAC CTC ATG AAG CTG GCT ATG GTG AAG CTC Val Gln Gly Thr Ala Ala Asp Leu Met Lys Leu Ala Met Val Lys Leu 755 760 765	2424
TTC CCC AGG CTG GAG GAA ATG GGG GCC AGG ATG CTC CTT CAG GTC CAC Phe Pro Arg Leu Glu Glu Met Gly Ala Arg Met Leu Leu Gln Val His 770 775 780	2472
GAC GAG CTG GTC CTC GAG GCC CCA AAA GAG AGG GCG GAG GCC GTG GCC Asp Glu Leu Val Leu Gln Ala Pro Lys Glu Arg Ala Glu Ala Val Ala 785 790 795 800	2520
CGG CTG GCC AAG GAG GTC ATG GAG GGG GTG TAT CCC CTG GCC GTG CCC Arg Leu Ala Lys Glu Val Met Glu Gly Val Tyr Pro Leu Ala Val Pro 805 810 815	2568
CTG GAG GTG GAG GTG GGG ATA GGG GAG GAC TGG CTC TCC GCC AAG GAG Leu Glu Val Glu Val Gly Ile Gly Glu Asp Trp Leu Ser Ala Lys Glu 820 825 830	2616
TGATACCAACC	2626

FIG. 1D

Y-DNA STR = ~~TCGCGCGGCG~~

WT :	R	R	A	A	K	T	I	N	F	G	V	L	Y
E.coli	659 754	660 755	663 758									I	F
					S	S	V	I				T	
					E							V	
					P	N	T	D					
					G	I	L	V					
					K	P							
					R	R							
					H								

FIG. 2A

WT :	R	R	A	A	K	T	I	N	F	G	V	L	Y
E.coli	659 754	660 755	663 758						Y	S			
					P					Q			
					G					R			
					S						K		
					I								
					K								
					W								
					C								
					A								

FIG. 2C

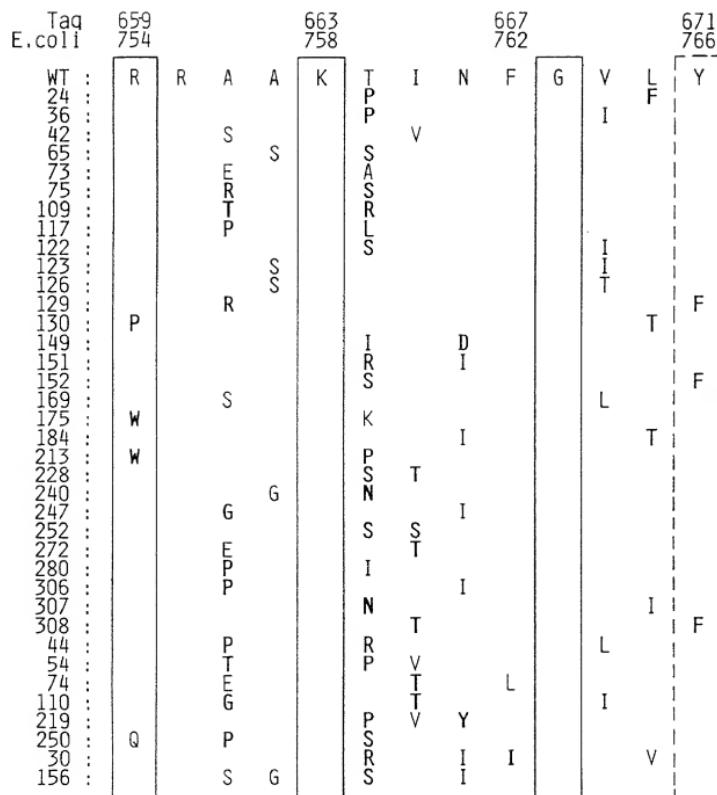
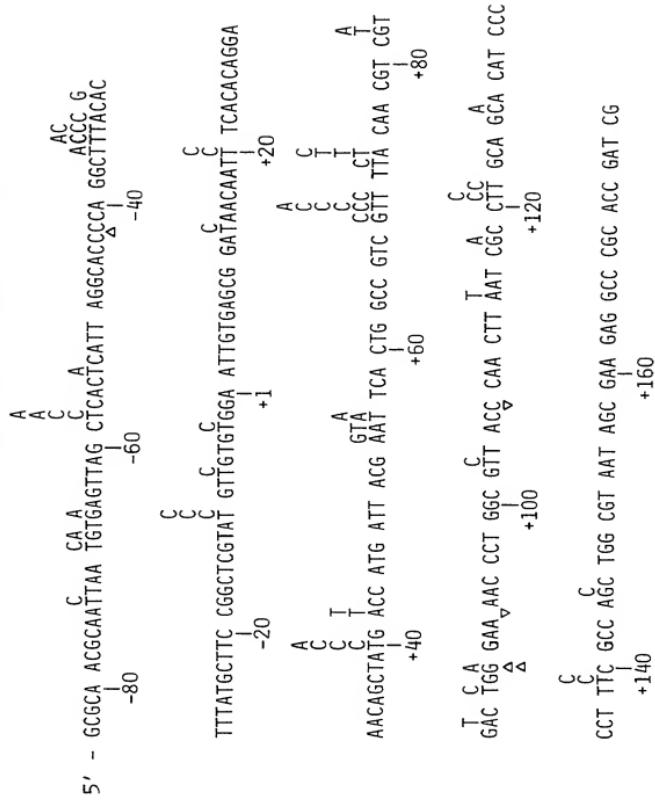


FIG. 2B



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